CLAIMS

What is claimed is:

1. A digital CDMA wireless communication system comprising:

a plurality of transmitters, one or more of said transmitters comprising a base station baseband processor, a finite impulse response (FIR) filter, a pre-distortion phase equalizer and a digital-to-analog (DAC) converter;

a plurality of receivers, one or more of said receivers comprising an analog to digital (ADC) converter, a FIR filter, a phase equalizer and a receiver baseband processor; and

said receiver FIR filter being matched to said transmitter FIR filter and said receiver phase equalizer is matched to said pre-distortion phase equalizer.

2. A wireless CDMA communication system as in claim 1 wherein said transmitter FIR filter and said receiver FIR filter are constrained such that $|H_{tx}(z)H_{rx}(z)|$ has linear phase and odd symmetry about half the inter-chip frequency ($f_c/2$).

3. A digital CDMA wireless communication system as in claim 1 wherein the transmitter predistortion phase equalizer and said receiver phase equalizer are constrained to $H_{rxeq}(z)=H_{txeq}(z^{-1})$ in the z domain.

4. A digital CDMA wireless communication system as in claim 3 wherein each of the predistortion phase equalizer and the receiver phase equalizer has a transfer function of

$$H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

where $a_0=b_2$, $a_1=b_1$, and $a_2=b_0$.

5. A wireless CDMA communication system as in claim 4 wherein said transmitter FIR filter and said receiver FIR filter are constrained such that

$|H_{tx}(z)H_{rx}(z)|$ has linear phase and odd symmetry about half the inter-chip frequency ($f_c/2$).

6. A digital CDMA wireless communication system as in claim 5 wherein the circuit response ($H(z)$) for the path from said base station baseband processor in said one or more transmitter to said receiver baseband processor has a linear phase and flat amplitude in-band such that ($H(z)=H_{tx}(z)H_{txeq}(z)H_{rx}(z)H_{rxeq}(z)$).

7. A digital CDMA wireless communication system as in claim 1 wherein the circuit response ($H(z)$) for the path from said base station baseband processor in said one or more transmitter to said receiver baseband processor has a linear phase and flat amplitude in-band such that ($H(z)=H_{tx}(z)H_{txeq}(z)H_{rx}(z)H_{rxeq}(z)$).